

FIG. 1A2



FIG. 1A3



FIG. 1A1



FIG. 1B2

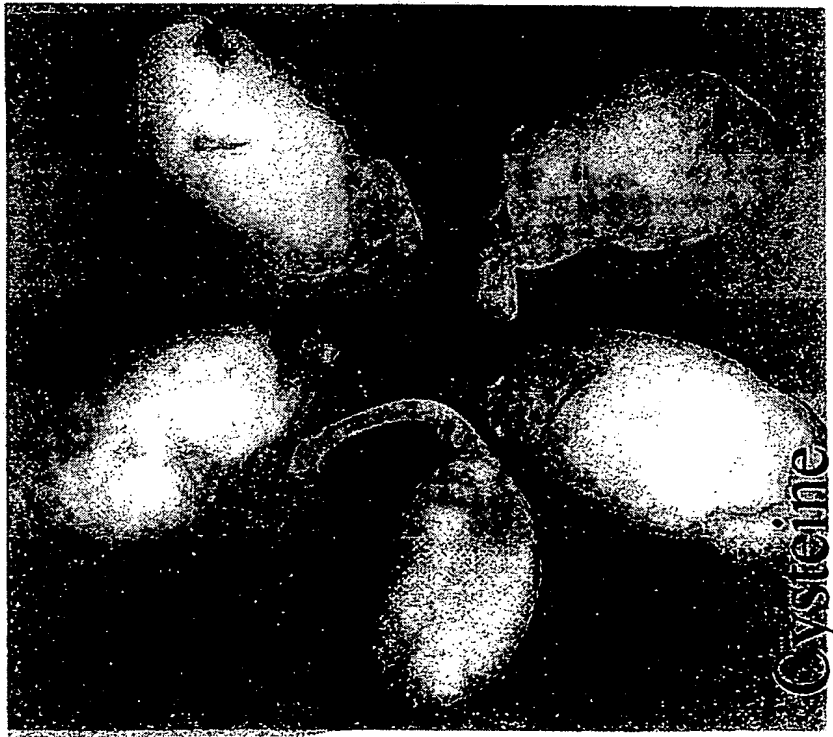
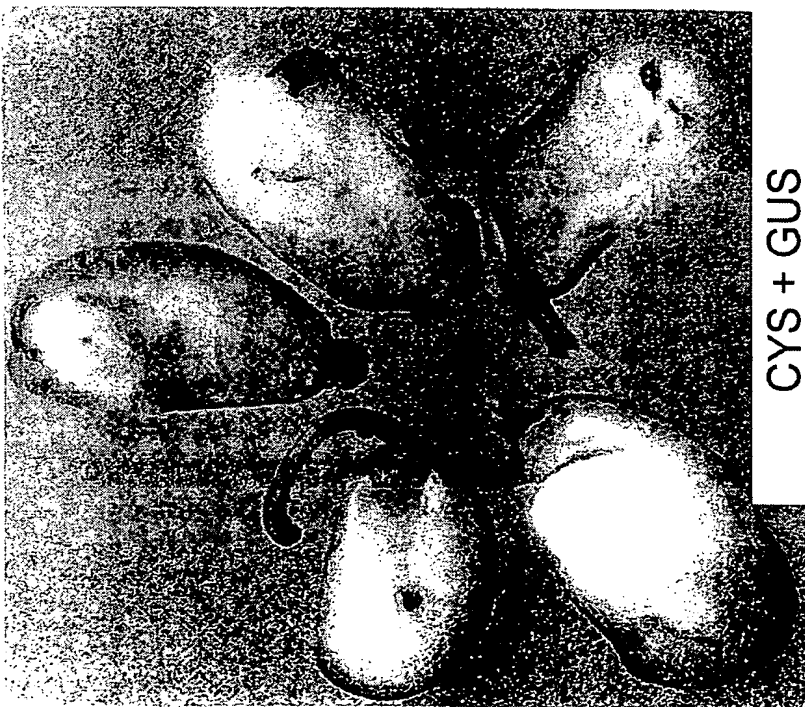


FIG. 1B1



CYS + GUS

FIG. 1B3



0 mg/l CYS + GUS

FIG. 1B4

| Agrobacteria infection of soybean explants 5 days after co-culture | | | | | | | | | |
|--|----------|----------|----------|------|----------|-----|--------|------|----------|
| Exp. #1 | Genotype | Agrobact | Temps °C | None | very low | low | medium | good | superior |
| Cysteine 0 | Bert | AGL1 | 25 | x | x | | | | |
| Cysteine 100 | Bert | AGL1 | 25 | | | | x | x | |
| Cysteine 200 | Bert | AGL1 | 25 | | | x | x | | |
| Cysteine 300 | Bert | AGL1 | 25 | | | | x | x | |
| Cysteine 400 | Bert | AGL1 | 25 | | | | | x | |
| Exp. #2 | Genotype | Agrobact | Temps °C | None | very low | low | medium | good | superior |
| Cysteine 0 | MN1301 | AGL1 | 21 | | x | | | | |
| Cysteine 0 | MN1301 | AGL1 | 25 | | x | | | | |
| Cysteine 100 | MN1301 | AGL1 | 21 | | | | x | x | |
| Cysteine 100 | MN1301 | AGL1 | 25 | | | | x | x | |
| Cysteine 200 | MN1301 | AGL1 | 21 | | x | | | | |
| Cysteine 200 | MN1301 | AGL1 | 25 | | | | | x | |
| Cysteine 300 | MN1301 | AGL1 | 21 | | | | | x | x |
| Cysteine 300 | MN1301 | AGL1 | 25 | | | | x | x | |
| Cysteine 400 | MN1301 | AGL1 | 21 | | | | x | x | |
| Cysteine 400 | MN1301 | AGL1 | 25 | | | | x | x | |
| Exp. #3 | Genotype | Agrobact | Temps °C | None | very low | low | medium | good | superior |
| Cysteine 0 | MN0901 | AGL1 | 4/22 | | x | | | | |
| Cysteine 0 | MN0901 | AGL1 | 4/25 | x | x | | | | |
| Cysteine 0 | MN0901 | AGL1 | 28/22 | | | x | x | | |
| Cysteine 0 | MN0901 | AGL1 | 28/25 | | | x | | | |
| Cysteine 100 | MN0901 | AGL1 | 4/22 | | | x | | | |
| Cysteine 100 | MN0901 | AGL1 | 4/25 | | | | x | | |
| Cysteine 100 | MN0901 | AGL1 | 28/22 | | | | x | x | |
| Cysteine 100 | MN0901 | AGL1 | 28/25 | | | | x | x | |
| Cysteine 200 | MN0901 | AGL1 | 4/22 | | | x | x | | |
| Cysteine 200 | MN0901 | AGL1 | 4/25 | | | | | x | |
| Cysteine 200 | MN0901 | AGL1 | 28/22 | | | x | x | | |
| Cysteine 200 | MN0901 | AGL1 | 28/25 | | | | x | | |
| Cysteine 300 | MN0901 | AGL1 | 4/22 | | | | | x | |
| Cysteine 300 | MN0901 | AGL1 | 4/25 | | | | x | x | |

FIG. 1C

| | | | | | | | | | |
|----------------------|-----------------|-----------------|---------------------|-------------|---------------------|------------|---------------|-------------|-----------------|
| Cysteine 300 | MN0901 | AGL1 | 28/22 | | | | | x | x |
| Cysteine 300 | MN0901 | AGL1 | 28/25 | | | | | x | |
| Cysteine 400 | MN0901 | AGL1 | 4/22 | | | | | x | x |
| Cysteine 400 | MN0901 | AGL1 | 4/25 | | | | | x | x |
| Cysteine 400 | MN0901 | AGL1 | 28/22 | | | | | | x |
| Cysteine 400 | MN0901 | AGL1 | 28/25 | | | | | | x |
| Exp. #4 | Genotype | Agrobact | Temps °C | None | very low | low | medium | good | superior |
| Cysteine 0L0S | Bert | AGL1 | 28 | | | x | | | |
| Cysteine 0L0S | Bert | AGL1 | 4 | | x | | | | |
| Cysteine 400L0S | Bert | AGL1 | 28 | | x | | | | |
| Cysteine 400L0S | Bert | AGL1 | 4 | | x | | | | |
| Cysteine 0L400S | Bert | AGL1 | 28 | | | | | x | |
| Cysteine 0L400S | Bert | AGL1 | 4 | | | | x | | |
| Cysteine 400L400S | Bert | AGL1 | 28 | | | | | x | x |
| Cysteine 400L400S | Bert | AGL1 | 4 | | | | | x | x |
| Exp. #5 | Genotype | Agrobact | Temps °C | None | very low | low | medium | good | superior |
| Cysteine 0L0S | MN0901 | AGL1 | 25 | | | x | | | |
| Cysteine 400L0S | MN0901 | AGL1 | 25 | | | x | | | |
| Cysteine 0L400S | MN0901 | AGL1 | 25 | | | | | | x |
| Cysteine 400L400S | MN0901 | AGL1 | 25 | | | | | | x |
| Cysteine 400L400S | MN0901 | AGL1 | 21 | | | | | | x |
| | | | | | | | | | |
| Cysteine 0L0S | Granite | AGL1 | 25 | | x | | | | |
| Cysteine 400L0S | Granite | AGL1 | 25 | | x | | | | |
| Cysteine 0L400S | Granite | AGL1 | 25 | | | | x | | |

FIG. 1D

| | | | | | | | | | |
|-------------------|-----------------|-----------------|-----------------|-------------|-----------------|------------|---------------|-------------|-----------------|
| Cysteine 400L400S | Granite | AGL1 | 25 | | | | x | x | |
| | | | | | | | | | |
| Cysteine 0L0S | MN1401 | AGL1 | 25 | | x | | | | |
| Cysteine 400L0S | MN1401 | AGL1 | 25 | | x | | | | |
| Cysteine 0L400S | MN1401 | AGL1 | 25 | | | | x | | |
| Cysteine 400L400S | MN1401 | AGL1 | 25 | | | | x | | |
| Exp. #6 | Genotype | Agrobact | Temps °C | None | very low | low | medium | good | superior |
| Cysteine 0L0S | MN1301 | AGL1 | 25 | | | x | | | |
| Cysteine 400L0S | MN1301 | AGL1 | 25 | | x | | | | |
| Cysteine 0L400S | MN1301 | AGL1 | 25 | | | | | x | |
| Cysteine 400L400S | MN1301 | AGL1 | 25 | | | | | x | |
| Exp. #7 | Genotype | Agrobact | Temps °C | None | very low | low | medium | good | superior |
| Cysteine 0L0S | Bert | AGL1 | 25 | | x | | | | |
| Cysteine 0L400S | Bert | AGL1 | 25 | | | | | x | x |
| Cysteine 0L600S | Bert | AGL1 | 25 | | | | | x | x |
| Cysteine 0L800S | Bert | AGL1 | 25 | | | | | x | |
| Cysteine 0L1000S | Bert | AGL1 | 25 | | | | | x | |
| Exp. #8 | Genotype | Agrobact | Temps °C | None | very low | low | medium | good | superior |
| Cysteine 400L400S | MN0901 | NONE | 25 | x | | | | | |
| | | | | | | | | | |
| Cysteine 400L0S | MN0901 | LBA4404 | 25 | | | x | x | | |
| Cysteine 400L400S | MN0901 | LBA4404 | 25 | | | | | | xx |

FIG. 1E

| | | | | | | | | | |
|-------------------|-----------------|-----------------|-----------------|-------------|-----------------|------------|---------------|-------------|-----------------|
| Cysteine 400L0S | MN0901 | AGL1 | 25 | | x | | | | |
| Cysteine 400L400S | MN0901 | AGL1 | 25 | | | | | x | |
| | | | | | | | | | |
| Cysteine 400L0S | MN1801 | AGL1 | 25 | | x | | | | |
| Cysteine 400L400S | MN1801 | AGL1 | 25 | | | | x | x | |
| | | | | | | | | | |
| Cysteine 400L0S | MN0301 | AGL1 | 25 | | x | | | | |
| Cysteine 400L400S | MN0301 | AGL1 | 25 | | | | x | | |
| | | | | | | | | | |
| Cysteine 400L0S | Lambert | AGL1 | 25 | | x | | | | |
| Cysteine 400L400S | Lambert | AGL1 | 25 | | | | x | x | |
| Exp. #9 | Genotype | Agrobact | Temps °C | None | very low | low | medium | good | superior |
| Methionine | MN0901 | LBA4404 | 25 | | x | | | | |
| Methionine | MN0901 | LBA4404 | 22 | | | x | | | |
| Methionine | MN0901 | AGL1 | 25 | | x | | | | |
| Methionine | MN0901 | AGL1 | 22 | | x | | | | |
| | | | | | | | | | |
| Glutathione | MN0901 | LBA4404 | 25 | x | | | | | |
| Glutathione | MN0901 | LBA4404 | 22 | | x | | | | |
| Glutathione | MN0901 | LBA4404 | 25 | x | | | | | |
| Glutathione | MN0901 | LBA4404 | 22 | | x | | | | |
| | | | | | | | | | |
| Cysteine 400 | MN0901 | LBA4404 | 22 | | | | | | x |
| Cysteine 400 | MN0901 | LBA4404 | 25 | | | | | | x |
| Cysteine 400 | MN0901 | AGL1 | 22 | | | | | x | |
| Cysteine 400 | MN0901 | AGL1 | 25 | | | | | x | |
| Cysteine 0 | MN0901 | LBA4404 | 22 | | | x | | | |
| Cysteine 0 | MN0901 | LBA4404 | 25 | | | x | | | |

FIG. 1F

| | | | | | | | | | |
|--------------|---------|------|----|--|---|---|--|--|--|
| Cysteine 0 | MN0901 | AGL1 | 22 | | x | | | | |
| Cysteine 0 | MN0901 | AGL1 | 25 | | x | | | | |
| | | | | | | | | | |
| Cysteine 0 | Lambert | AGL1 | 22 | | x | | | | |
| Cysteine 0 | Lambert | AGL1 | 25 | | x | | | | |
| Cysteine 400 | Lambert | AGL1 | 22 | | | | | | |
| Cysteine 400 | Lambert | AGL1 | 25 | | | x | | | |

FIG. 1G

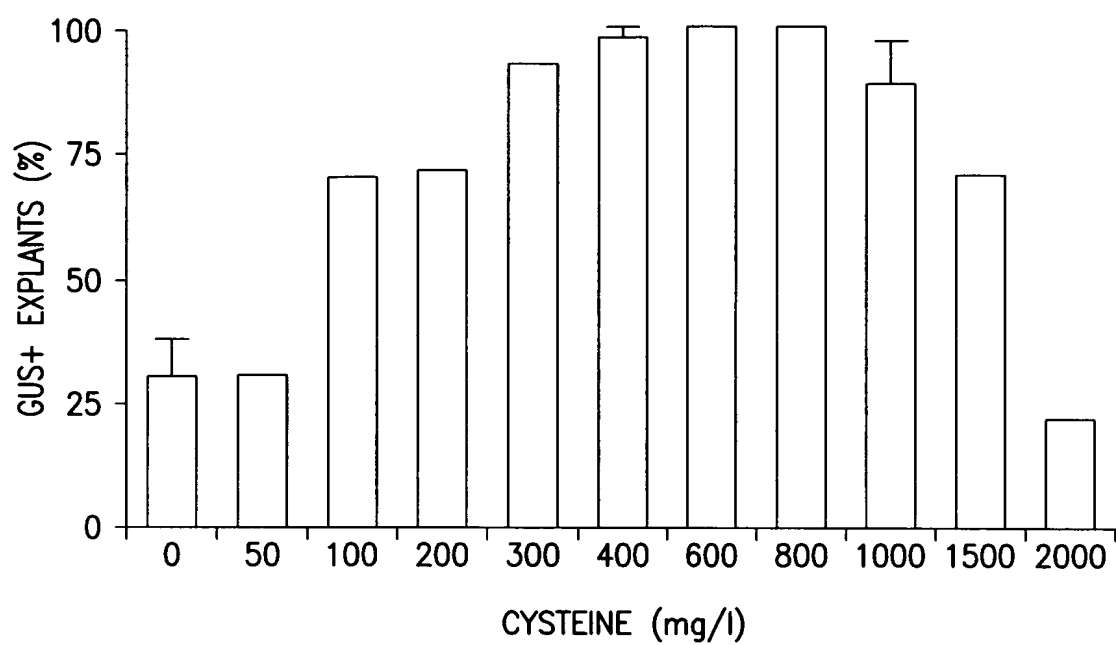


FIG. 1H

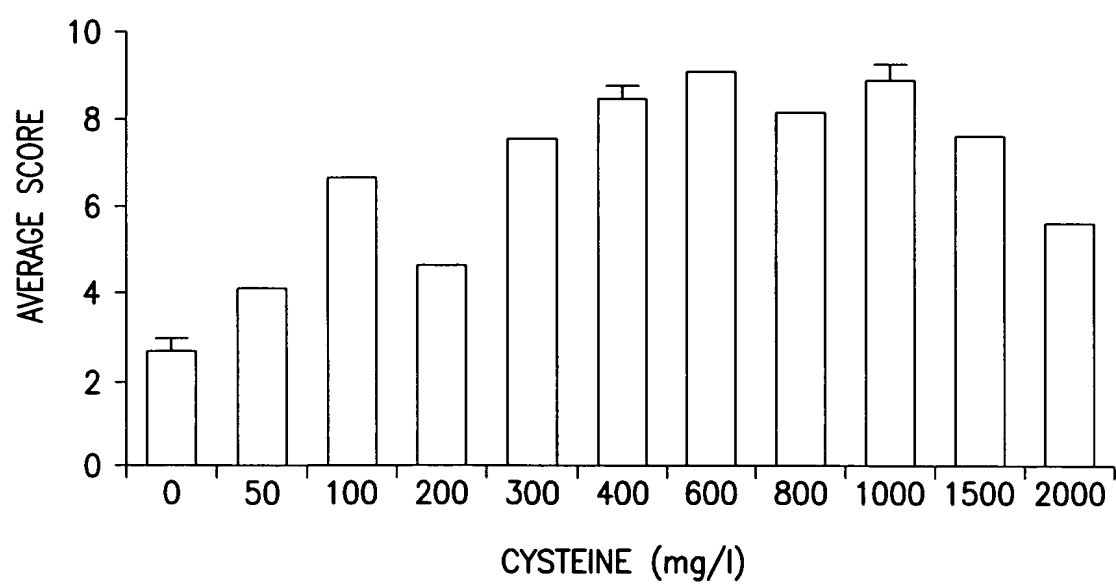


FIG. 1I

| Bert | Cysteine Experiment #1 | | | | | |
|-----------------|------------------------|--------------|-------------------|--------------|---------------------------|-----------|
| | | | | | % Explants with shoots | \bar{x} |
| 0 mg Cysteine | 3 | 0 | 0 | 6 | 0% | 2.9 |
| | 0 | 1 | 0 | 10 | | |
| | 8 | 2 | 6 | 2 | | |
| | 4 | 0 | 2 | | | |
| 50 mg Cysteine | 6 | 8 | 4 | 2 | 6.25% | 4.0 |
| | 7 + 2 shoots/events | 2 | 5 | 10 | | |
| | 0 | 9 | 2 | 1 | | |
| | 3 | 6 | 0 | 0 | | |
| 100 mg Cysteine | 8 + 1 shoot | 5 + 4 shoots | 2 | 0 | 20% | 4.3 |
| | 2 | 9 + 1 shoot | 4 | 5 | | |
| | 6 | 4 | 4 | 7 | | |
| | 3 | 5 | 1 | | | |
| 150 mg Cysteine | 14 | 3 | 2 | 15 | 14.3 | 6.5 |
| | 8 | 9 | 4 | 12 + 1 shoot | | |
| | 11 | 2 | 3 | | | |
| | 3 | 7 | 8 + 2 shoots | | | |
| 200 mg Cysteine | 14 | 9 | >18 + 4 shoots | 10 | 18.7 | 14.9 |
| | 12 | >23 | 11 | 17 | | |
| | 15 + >5 cluster | 17 | >30 | 19 + 1 shoot | | |
| | 10 | 6 | 12 | 16 | | |

FIG. 2

| MN1301 | Cysteine Experiment #1 | | | | % Explants with shoots | \bar{x} |
|-----------------|------------------------|--------------|----|----|---------------------------|-----------|
| | | | | | | |
| 0 mg Cysteine | 0 | 2 | 0 | | | |
| | 1 | 7 | | | | |
| | 3 | 0 | | | 0% | 1.9 |
| | 3 | 1 | | | | |
| 50 mg Cysteine | 5 | 5 | | | | |
| | 7 | 6 | | | | |
| | 12 | 13 | | | 0% | 9.4 |
| | 15 | 12 | | | | |
| 100 mg Cysteine | 14 | 17 + 1 shoot | 26 | | | |
| | 12 | >23 | 29 | | | |
| | 16 | 5 | 18 | | 9% | 15.6 |
| | 12 | 0 | | | | |
| 150 mg Cysteine | 1 | 15 | 26 | 17 | | |
| | 8 | 17 | 23 | 3 | | |
| | 19 | 4 | 18 | 5 | 0% | 11.8 |
| | 5 | 1 | 20 | 7 | | |
| 200 mg Cysteine | 16 | 8 | 16 | | | |
| | 27 | >20 | 4 | | | |
| | 23 | 25 | | | 0% | 18.2 |
| | 28 | >15 | | | | |

FIG. 3

MN0901

Cysteine Experiment #1

| | 4°C pre-treatment | | No pre-treatment | | % | \bar{x} |
|-----------------|--------------------------------------|--|---|---|-------|-----------|
| | 22°C incubation | 25°C incubation | 22°C incubation | 25°C incubation | | |
| 0 mg Cysteine | 4 1 5 18 $\bar{x} = 7$ | 0 7 8 + 1 shoot 1 $\bar{x} = 4$ | 9 5 2 8 $\bar{x} = 6$ | 6 6 1 12 $\bar{x} = 6.2$ | 6.25% | 5.9 |
| 50 mg Cysteine | 13 8 14 4 $\bar{x} = 4.7$ | 3 11 8 7 $\bar{x} = 7.2$ | 14 11 12 17 $\bar{x} = 13.5$ | 6 4 9 7 $\bar{x} = 6.5$ | 0% | 4.2 |
| 100 mg Cysteine | 5 1 16 7 $\bar{x} = 7.2$ | 2 4 5 2 $\bar{x} = 3.2$ | 0 11 16 18 + 1 shoot $\bar{x} = 11.2$ | 13 19 19 7 $\bar{x} = 14.5$ | 6.25% | 9.0 |
| 150 mg Cysteine | 12 14 9 12 $\bar{x} = 11.7$ | 9 19 22 15 $\bar{x} = 16.2$ | >16 + >15 shoots 11 + 1 shoot 6 16 $\bar{x} = 12.2$ | 16 + >5 shoots 24 20 12 $\bar{x} = 19$ | 18.7% | 14.7 |
| 200 mg Cysteine | 19 14 10 9 $\bar{x} = 13$ | 9 14 12 14 $\bar{x} = 12.2$ | 24 12 16 16 $\bar{x} = 17$ | 13 14 25 6 $\bar{x} = 14.5$ | 0% | 14.1 |

FIG. 4

Bert Cysteine Experiment #2

| Bert | 0 mg Cysteine Liquid Co-culture media | | 200 mg Cysteine Liquid Co-culture media | | % | \bar{x} |
|--------------------------------|---|--|---|---|------|-----------|
| | 5 mg/L ppt | 3.33 mg/L ppt | 5 mg/L ppt | 3.33 mg/L ppt | | |
| 0 mg Cysteine Solid Media | 4 1 0 2 + 2 shoots 4 0 $\bar{x} = 1.8$ | 2 3 4 4 5 2 $\bar{x} = 3.3$ | 2 1 3 1 4 3 $\bar{x} = 2.3$ | 7 1 3 0 3 3 $\bar{x} = 2.8$ | 4.2% | 2.5 |
| 200 mg Cysteine Solid Media | 9 14 + 8 shoots MASS 11 >24 + 5 shoots 35 + 1 shoot 7 $\bar{x} = 20.1$ | 5 >25 >27 + 1 shoot 27 11 >18 $\bar{x} = 18.8$ | 3 8 + 2 shoots 4 17 20 >15 $\bar{x} = 11.1$ | 12 7 11 8 19 + 1 shoot 6 $\bar{x} = 10.5$ | 25% | 15.1 |

FIG. 5

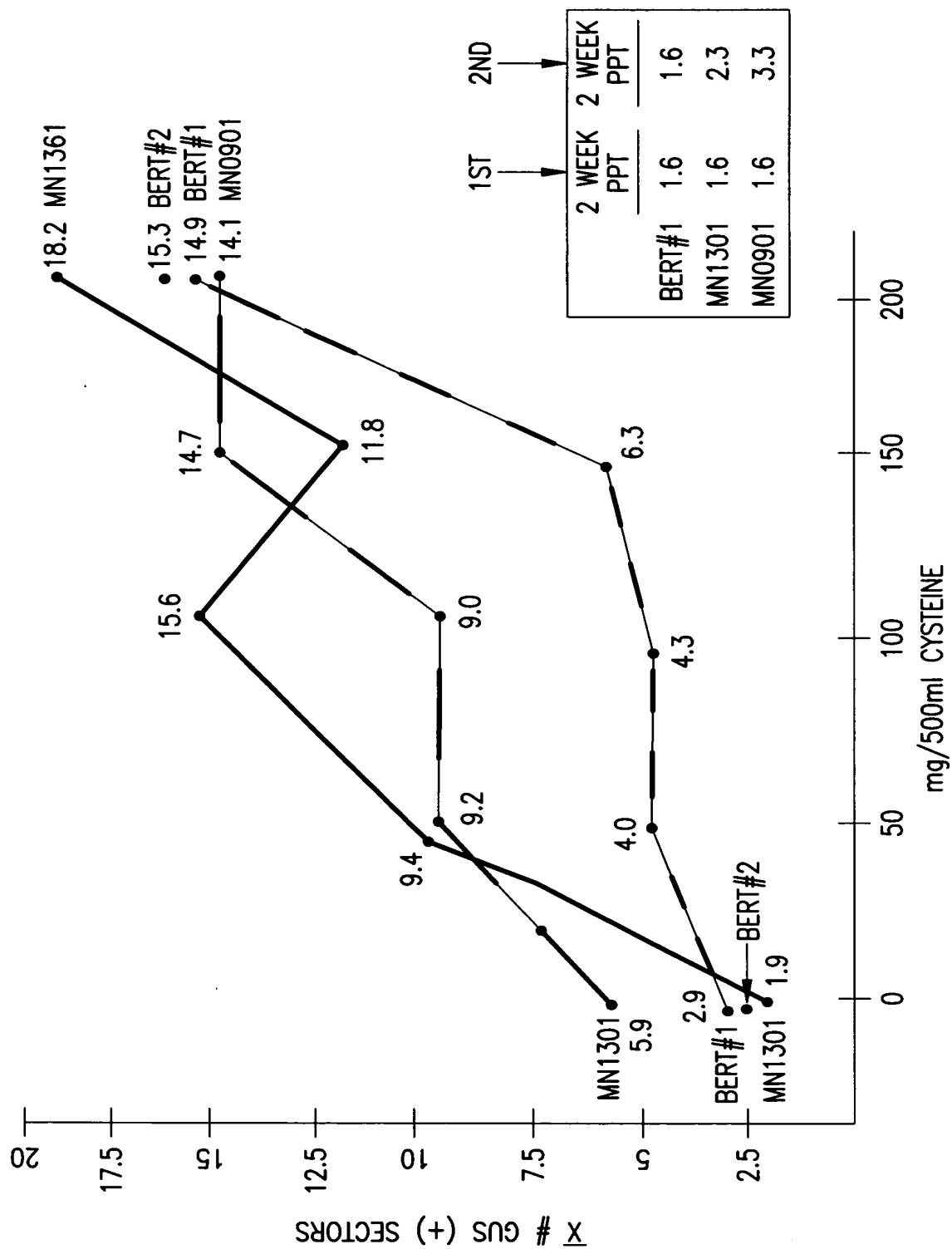


FIG. 6

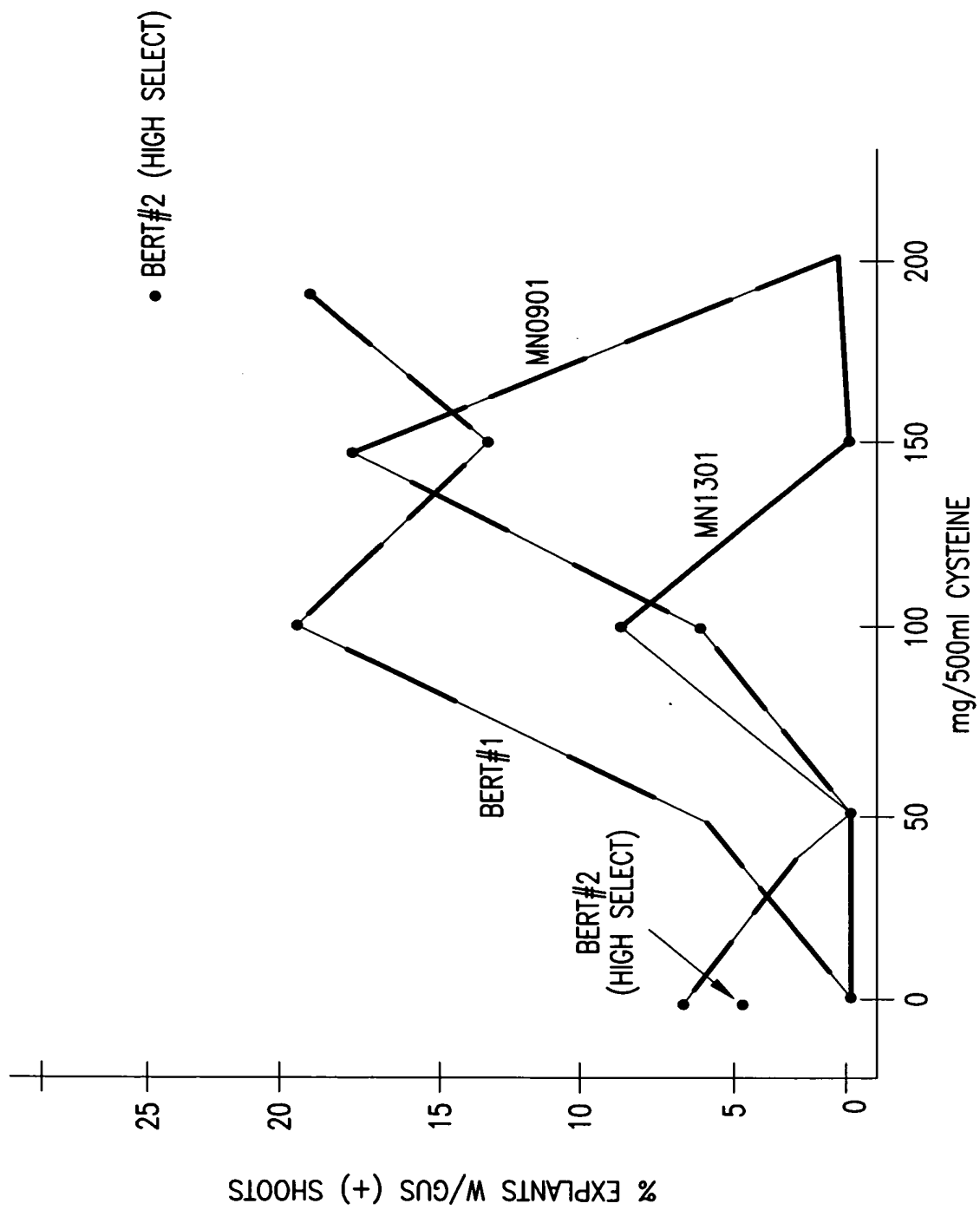


FIG. 7

BERT GENOTYPE HERBICIDE SELECTION:
PPT % EXPLANTS W/GUS (+) SHOOTS AT 4 WEEKS

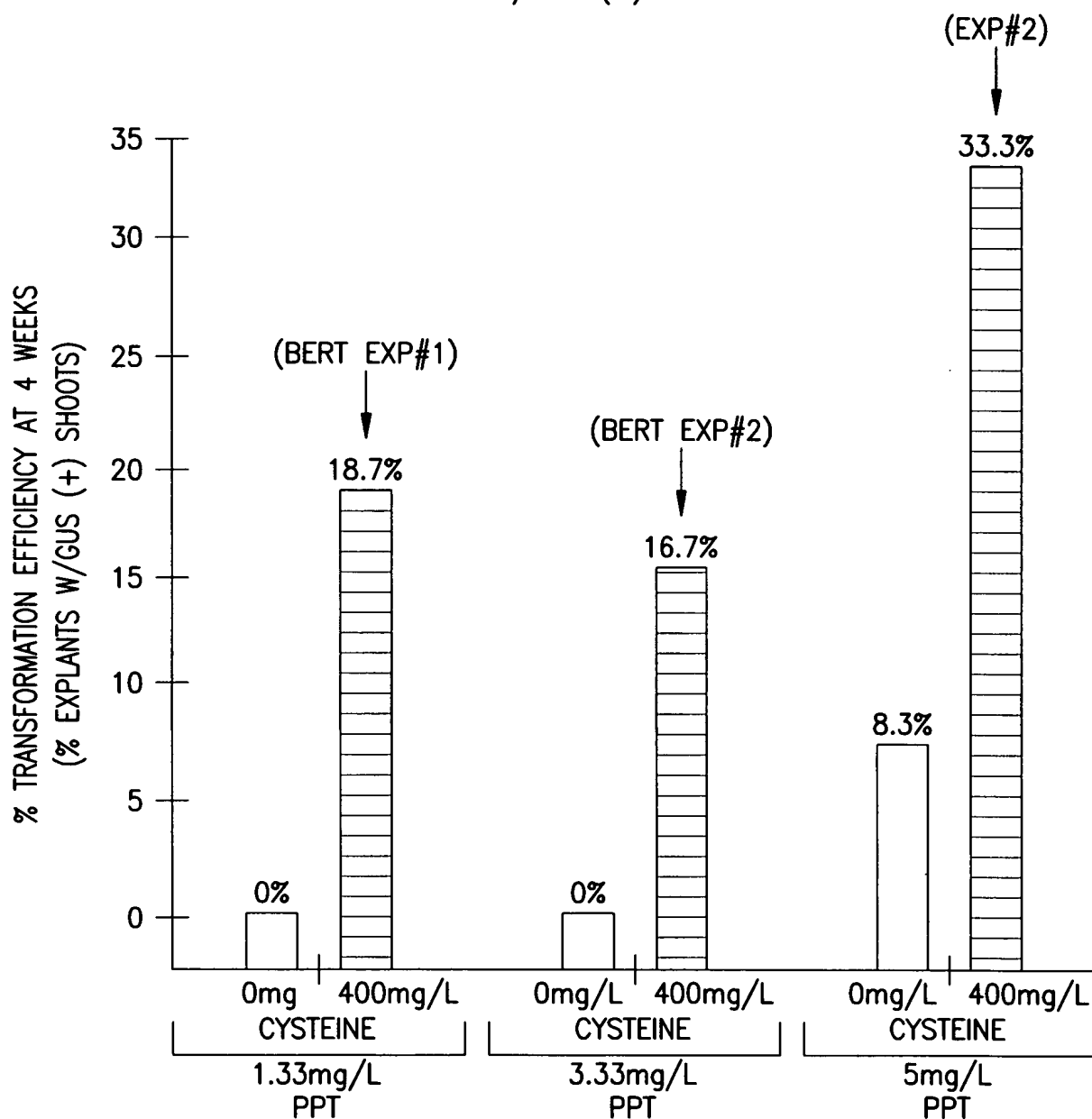


FIG. 8

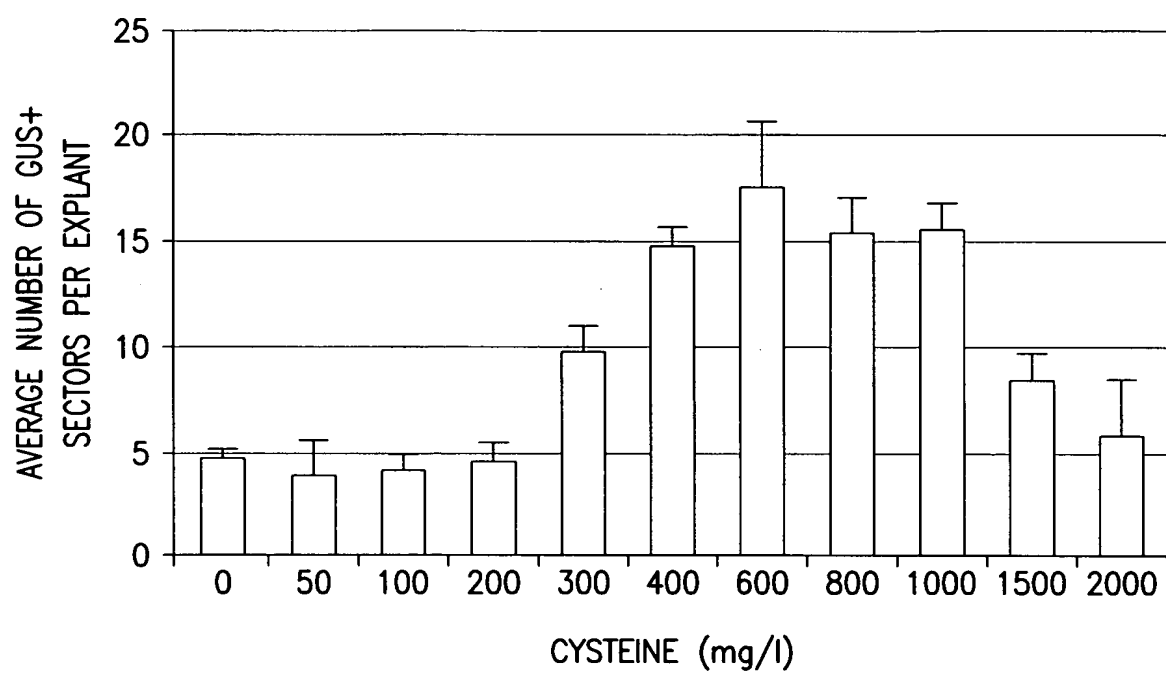


FIG. 9

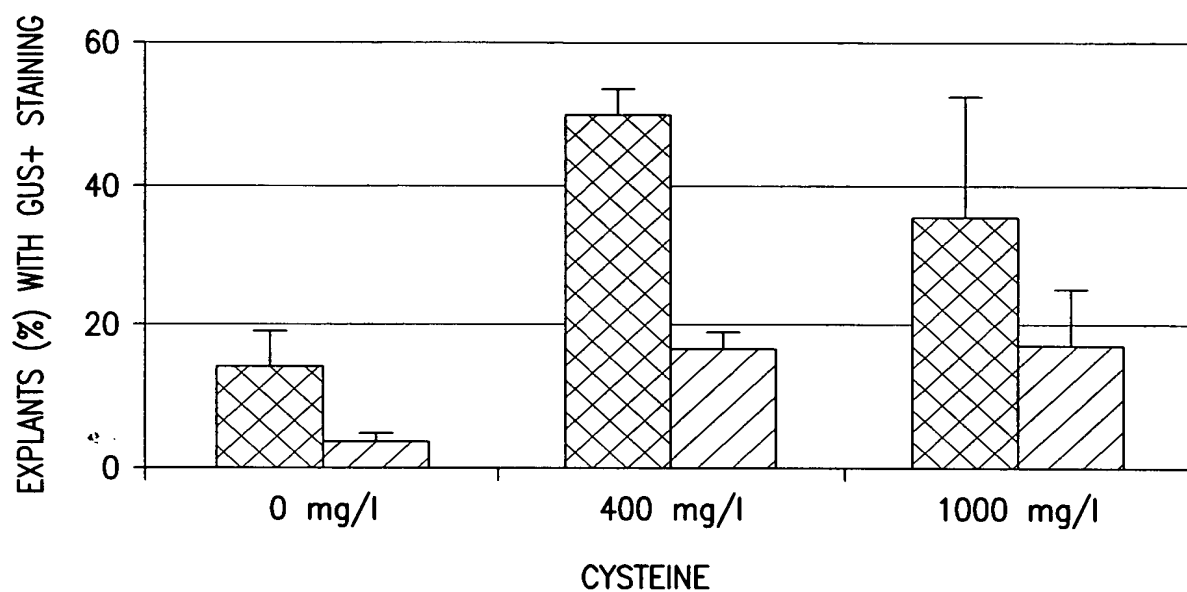


FIG. 10A

| CYSTEINE mg/l | # EXPLANTS WITH SHOOT PRIMORDIA/ TOTAL EXPLANTS |
|------------------|---|
| 0 | 4/88 |
| 50 | 0/4 |
| 100 | 1/16 |
| 200 | 3/15 |
| 300 | 2/23 |
| 400 | 17/105 |
| 600 | 5/10 |
| 800 | 1/22 |
| 1000 | 7/34 |
| 1500 | 1/8 |
| 2000 | 1/3 |

FIG. 10B

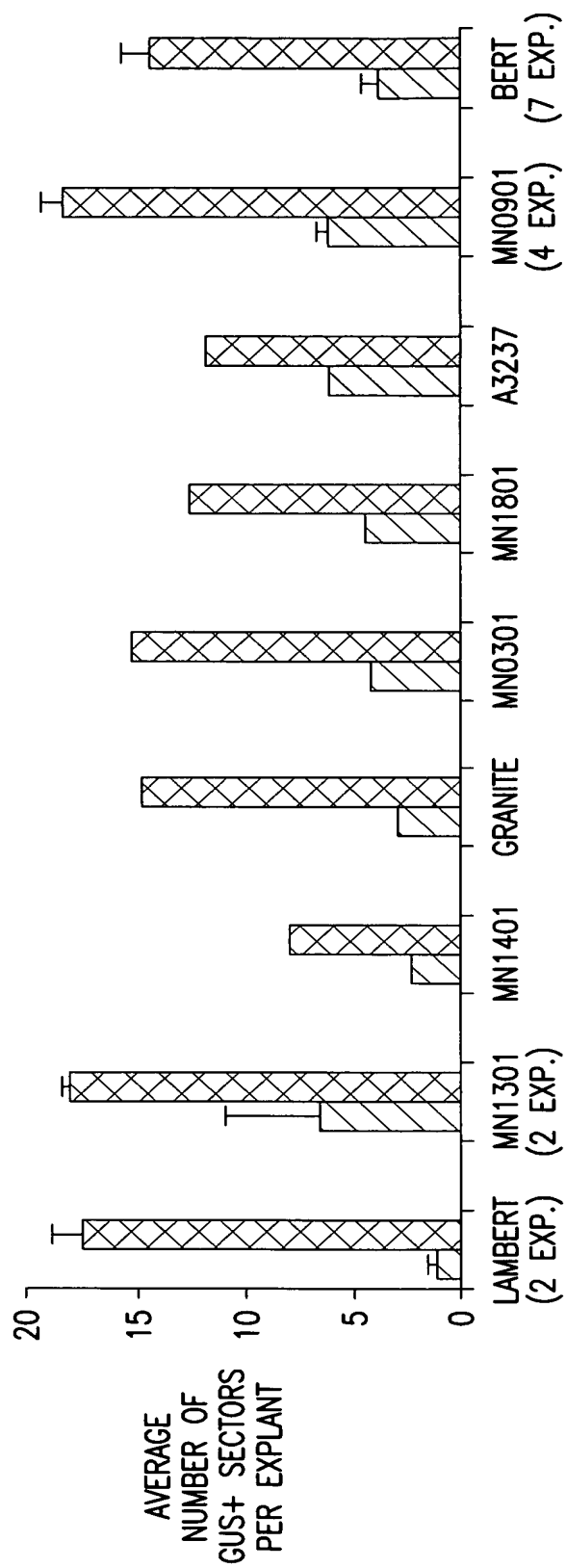


FIG. 11

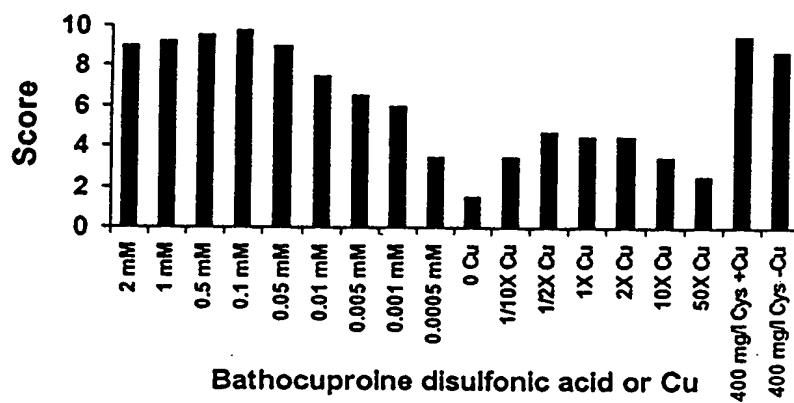


FIG. 12A

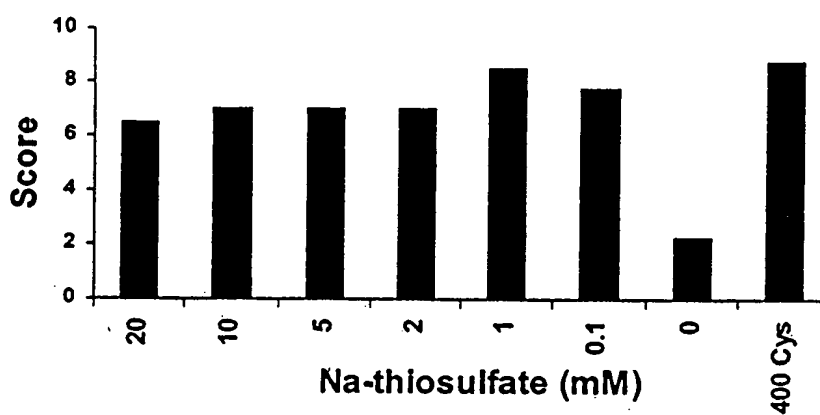


FIG. 12B

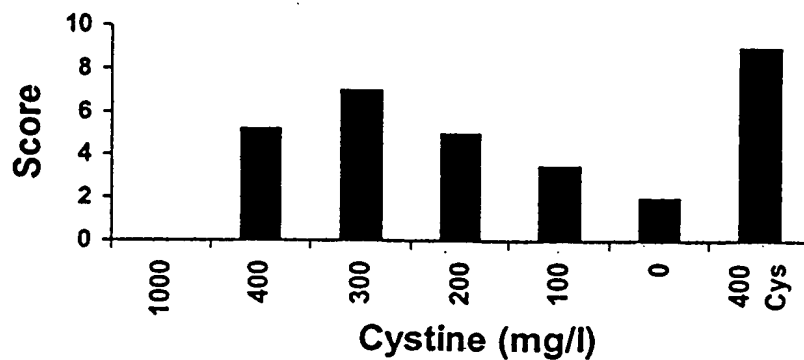


FIG. 12C

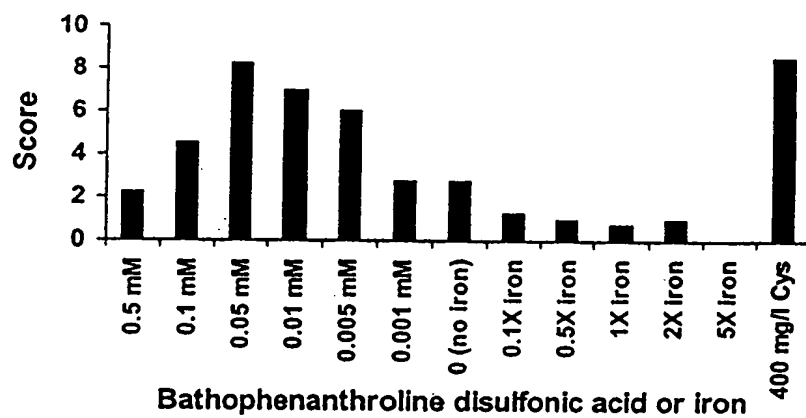


FIG. 12D

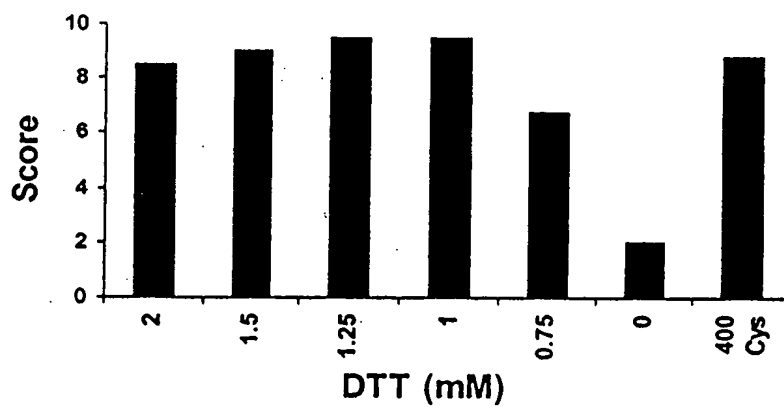


FIG. 12E

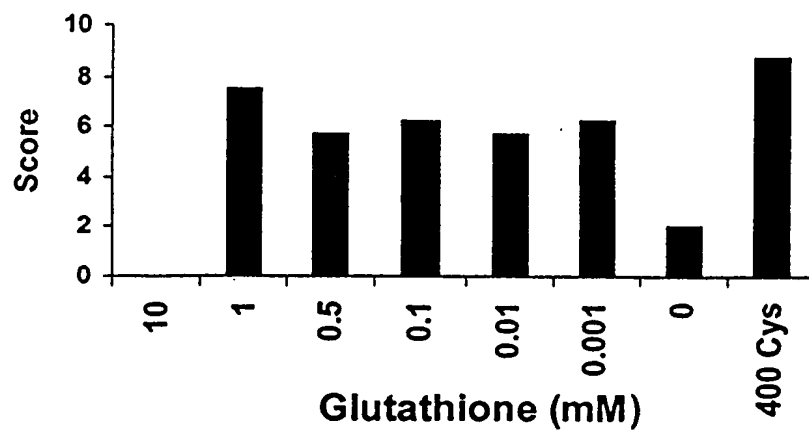


FIG. 12F

| Bert | # Explants Inoculated | # Explants Sacrificed | # Explants Contaminated | % Shoot Formation | Total # Explants* | Elongated Shoots | Independent Events |
|-------------------|-----------------------|-----------------------|-------------------------|-------------------|-------------------|------------------|--------------------|
| 0 control | 190 | 10 | 0 | 100/180 = 55.5% | 180 | | |
| 400 mg/l Cysteine | 190 | 10 | 0 | 160/180 = 88.8% | 180 | 705,641 | 705,641 |

* Includes those explants with zero shoot growth

| A3237 | # Explants Inoculated | # Explants Sacrificed | # Explants Contaminated | % Shoot Formation | Total # Explants* | Elongated Shoots | Independent Events |
|-------------------|-----------------------|-----------------------|-------------------------|-------------------|-------------------|------------------|--------------------|
| 0 control | 188 | 10 | 0 | 118/178 = 66.3% | 178 | 644 | 644 |
| 400 mg/l Cysteine | 188 | 10 | 0 | 151/178 = 84.8% | 178 | 657, 655, 643 | 657, 655, 643 |

* Includes those explants with zero shoot growth

| Bert | # Explants Inoculated | # Explants Sacrificed | # Explants Contaminated | % Shoot Formation | Total # Explants* | Elongated Shoots | Independent Events |
|--------------------|-----------------------|-----------------------|-------------------------|-------------------|-------------------|---|--------------------|
| 0 control | 205 | 10 | 0 | 143/195 = 73% | 195 | | |
| 1000 mg/l Cysteine | 210 | 10 | 0 | 160/200 = 80% | 200 | 525, 527, 666, 627, 620, 611, 590, 564, 661 | 525, 527, 666, 627 |

* Includes those explants with zero shoot growth

FIG. 13A

| A3237 | # Explants Inoculated | # Explants Sacrificed | # Explants Contaminated | % Shoot Formation | Total # Explants* | Elongated Shoots | Independent Events |
|--------------------|-----------------------|-----------------------|-------------------------|-------------------|-------------------|------------------|--------------------|
| 0 control | 190 | 10 | 75 | NA contamin. | 105 | | |
| 1000 mg/l Cysteine | 195 | 10 | 56 | NA contamin. | 129 | 630 | 630 |

* Includes those explants with zero shoot growth

** Many more explants tossed throughout experiment, any % efficiency will be underestimated.

| Hygro #1 | # Explants Inoculated | # Explants Sacrificed | # Explants Contaminated | % Shoot Formation | Total # Explants* | Elongated Shoots | Independent Events |
|-------------------|-----------------------|-----------------------|-------------------------|-------------------|-------------------|------------------|--------------------|
| 0 control | 213 | 7 | 4 | 164/202 = 81.2% | 202 | | |
| 400 mg/l Cysteine | 213 | 7 | 2 | 182/204 = 89.2% | 204 | 694, 695 | 694, 695 |

* Includes those explants with zero shoot growth

| Hygro #2 | # Explants Inoculated | # Explants Sacrificed | # Explants Contaminated | % Shoot Formation | Total # Explants* | Elongated Shoots | Independent Events |
|-------------------|-----------------------|-----------------------|-------------------------|-------------------|-------------------|------------------|--------------------|
| 0 control | 219 | 7 | 39 | 1145/173 = 83.8% | 173 | | |
| 400 mg/l Cysteine | 220 | 7 | 17 | 179/196 = 91.3% | 196 | | |

* Includes those explants with zero shoot growth

FIG. 13B

| Hygro #3 Bert | # Explants Inoculated | # Explants Sacrificed | # Explants Contaminated | % Shoot Formation | Total # Explants* | Elongated Shoots | Independent Events |
|-------------------------|--------------------------|--------------------------|----------------------------|----------------------|----------------------|---------------------|-----------------------|
| 0 control | 100 | 7 | 5 | 77/88 = 87.5% | 88 | | |
| 400 Cys | 107 | 7 | 0 | 88/100 = 88% | 100 | | |
| 1 mM DTT | 105 | 7 | 2 | 75/96 = 78% | 96 | 703 | 703 |
| 400 Cys + 1 mM DTT | 100 | 7 | 6 | 77/87 = 88.5% | 87 | | |
| 400 Cys + 0.3 mM DTT | 25 | 7 | 0 | 17/18 = 94.4% | 18 | | |

* Includes those explants with zero shoot growth

| Hygro #4 Bert | # Explants Inoculated | # Explants Sacrificed | # Explants Contaminated | % Shoot Formation | Total # Explants* | Elongated Shoots | Independent Events |
|-----------------------|--------------------------|--------------------------|----------------------------|----------------------|----------------------|---------------------|-----------------------|
| 0 control | 116 | 7 | 38 | 67/71 = 94.4% | 71 | | |
| 400 Cys | 116 | 7 | 38 | 67/71 = 94.4% | 71 | | |
| 1 mM DTT | 116 | 7 | 11 | 79/98 = 80.6% | 98 | | |
| 400 Cys + 1 mM DTT | 116 | 7 | 29 | 73/80 = 91.25% | 80 | 696, 699 | 696, 699 |

* Includes those explants with zero shoot growth

FIG. 13C

| Hygro #5 Bert | # Explants Inoculated | # Explants Sacrificed | # Explants Contaminated | % Shoot Formation | Total # Explants* | Elongated Shoots | Independent Events |
|------------------------|--------------------------|--------------------------|----------------------------|----------------------|----------------------|---------------------|-----------------------|
| 0 control | 110 | 7 | 1 | 81/102 = 79.1% | 102 | | |
| 1000 Cys | 110 | 7 | 1 | 91/102 = 89.2% | 102 | | |
| 1 mM DTT | 110 | 7 | 3 | 77/100 = 77% | 100 | | |
| 1000 Cys + 1 mM DTT | 113 | 7 | 16 | 88/104 = 84.6% | 104 | | |

* Includes those explants with zero shoot growth

FIG. 13D